

Rolling Knolls Landfill Settling Parties

Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill Superfund Site

Chatham, New Jersey

October 2015



A handwritten signature in blue ink that reads "Suzanne J. Walls".

Suzanne Walls
Project Manager

A handwritten signature in blue ink that reads "Andrew Guthertz".

Andrew Guthertz
Staff Geologist

**Addendum 1 to the Data Gaps
Sampling and Analysis Plan**

Rolling Knolls Landfill Superfund
Site
Chatham, New Jersey

Prepared for:
Rolling Knolls Landfill Settling Parties

Prepared by:
ARCADIS U.S., Inc.
8 South River Road
Cranbury
New Jersey 08512
Tel 609 860 0590
Fax 609 860 0491

Our Ref.:
B0033202

Date:
October 2015

1. Introduction	1
1.1 Objectives	1
1.2 Data Gaps SAP Organization	1
2. Additional Soil and Sediment Sampling	3
2.1 Soil Sampling	3
2.1.1 Soil Sample Locations	3
2.1.2 Soil Sampling Procedures	4
2.1.3 Soil Sample Analyses	5
2.2 Sediment Sampling	6
2.2.1 Sediment Sample Locations	6
2.2.2 Sediment Sampling Procedures	6
2.2.3 Sediment Sample Analysis	7
2.3 Analytical Procedures	7
3. Schedule	8
4. Project Management	9
4.1 Staffing	9
4.2 Coordination	9
5. References	10

Tables

Table 1	Proposed Soil Sample Locations, Depths, and Analyses
---------	--

Figures

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3a	Proposed Sampling Locations - North
Figure 3b	Proposed Sampling Locations - South
Figure 4	Project Organizational Chart

Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
bgs	below ground surface
COCs	constituents of concern
CLP	Contract Laboratory Program
Data Gaps SAP	Data Gaps Sampling and Analysis Plan
NJDEP	New Jersey Department of Environmental Protection
PCB	polychlorinated biphenyl
PID	photoionization detector
QAPP	Quality Assurance Project Plan
site	Rolling Knolls Landfill Superfund Site, located in Chatham Township, New Jersey
SIM	selective ion monitoring
SOP	Standard Operating Procedure
SRS	Soil Remediation Standard
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TestAmerica	TestAmerica Laboratories, Inc.
the Group	Chevron Environmental Management Company, Lucent Technologies Inc., (now known as Alcatel-Lucent USA Inc.) and Novartis Pharmaceuticals Corporation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
VOC	volatile organic compound



Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill
Superfund Site
Chatham, New Jersey

1. Introduction

On behalf of Chevron Environmental Management Company for itself and on behalf of Kewanee Industries, Inc., Lucent Technologies Inc., (now known as Alcatel-Lucent USA Inc.) and Novartis Pharmaceuticals Corporation (collectively, the Group), ARCADIS U.S., Inc. (ARCADIS) prepared this Addendum 1 to the Data Gaps Sampling and Analysis Plan (Data Gaps SAP) for the Rolling Knolls Landfill Superfund Site (the "site"), located in Chatham Township, New Jersey. The location of the site is shown in Figure 1, and the site features are shown in Figure 2.

The Data Gaps SAP was submitted to the United States Environmental Protection Agency (USEPA) on September 17, 2014 and approved by the United States Environmental Protection Agency (USEPA) on November 18, 2014 (ARCADIS 2014a). Collection and analysis of soil, sediment, and groundwater samples proposed in the Data Gaps SAP was conducted from November 2014 to July 2015. This addendum proposes additional soil and sediment sampling to delineate constituents of concern (COCs) detected in samples collected during the initial Data Gaps SAP implementation.

1.1 Objectives

The objectives of the sampling proposed herein are to complete the objectives originally identified in Section 1.1 of the approved Data Gaps SAP (November 2014) and to address additional delineation concerns identified by the USEPA and New Jersey Department of Environmental Protection (NJDEP) that were requested to further delineate the nature and extent of contamination at the site.

In addition, the Group is proposing additional delineation sampling to that requested by USEPA and NJDEP. This addendum contains the sampling proposed by the USEPA, NJDEP, and the Group.

1.2 Data Gaps SAP Organization

This Data Gaps SAP is organized as described below.

- Section 2, Additional Soil and Sediment Sampling, presents each new task that will be conducted as part of the Data Gaps SAP and outlines proposed technical activities that will be conducted to complete each task.
- Section 3, Schedule, presents a schedule for the Data Gaps SAP activities.



Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill
Superfund Site
Chatham, New Jersey

- Section 4, Project Management, introduces the project team and describes the responsibilities of each project team member.
- Section 5, References, provides references used in the development of this Addendum 1 to the Data Gaps SAP.

A Quality Assurance Project Plan (QAPP), submitted on September 19, 2014 and approved by the USEPA on December 18, 2014 (ARCADIS 2014b), provides supporting information on site conditions, sampling requirements and procedures, and laboratory analytical procedures. Certain worksheets in the QAPP have been revised to accompany this addendum. These Include:

- Worksheet #14/16 – Project Tasks & Schedule
- Worksheet #17 – Sampling Design and Rationale
- Worksheet 18 – Sampling Locations and Methods; and
- Worksheet 20 – Field QC Summary

These revised worksheets are submitted as Addendum 1 to the QAPP.

2. Additional Soil and Sediment Sampling

2.1 Soil Sampling

2.1.1 Soil Sample Locations

The proposed soil sampling locations are shown on Figures 3a and 3b, along with previous surface soil sample results that were used to select the proposed locations. Soil sampling locations (sample numbers SS-165 through SS-176) are located off the boundary of the landfill in native soil, near where previous soil samples contained concentrations of one or more COCs exceeding its New Jersey Soil Remediation Standard (SRS). Proposed locations are also summarized in Table 1.

In general, the topography of the site is flat, and the landfill is slightly higher than the surrounding areas. Delineation samples collected outside the boundary of the landfill, often in areas that are at times inundated, are lower than the landfill because the landfill was constructed by filling a low-lying area. Areas where constituents could flow in runoff from the landfill were targeted for sampling in previous surface water and sediment sampling. Sampling locations have been modified to ensure that sampling is conducted in a topographically low area.

All perimeter locations are in potentially wet areas and are expected to consist of wetland soil. However, if these locations are below water at the time of collection, they will be designated sediment samples and will be collected using sediment sampling techniques (see Section 2.2). Soil sample locations SS-177 through SS-183 are located in the interior of the landfill.

The matrices at the proposed sample location were observed during a July 27, 2015 site visit conducted by ARCADIS and a representative of CDM Smith (consultant to the United States Army Corp of Engineers). Site conditions may change in response to precipitation or other factors. As a result, samples that are anticipated to consist of soil may be inundated and considered sediment at the time of sampling, and samples that were below water at the time of the site visit may be dry and considered soil at the time of sampling. The field crew will follow the appropriate standard operating procedure (SOP) (either SOP 14 [sediment sampling], SOP 5 [drilling procedures for soil sampling], or SOP 17 [manual procedures for soil sampling]) based on the current conditions during the time of sampling.

2.1.2 Soil Sampling Procedures

ARCADIS field personnel will advance soil borings to collect soil samples using a hand-driven Macrocore®. At sample locations SS-165 through SS-176, field personnel will use hand tools (e.g., slide-hammer) to advance a 2-inch-diameter by 2-foot-long stainless steel Macrocore® fitted with a dedicated acetate liner to 2 feet below ground surface (bgs). At sample locations SS-177 through SS-183, the first sample will be collected one foot beneath the waste material at each boring location and a second sample will be collected one foot directly above the underlying clay layer. Field personnel will advance a Macrocore® using a track mounted geoprobe to a depth below the landfilled materials. A dual tube or a discrete sampler will be used below the water table to ensure a representative sample is collected. The Macrocore® cutting shoe may be equipped with a disposable, plastic basket to increase recovery of loose material. Other sampling methods (e.g., hand auger, shovel) may be used to collect soil samples if conditions at a proposed sampling location do not allow for advancement of or adequate recovery with a hand-driven Macrocore®. At sample locations SS-184 through SS-186, located between MW-10 and MW-18, and at sample locations SS-187 through SS-191 located near monitoring well MW-3 (and adjacent to former temporary well points TWP-5 through TWP-9), field personnel will use hand tools (e.g., slide-hammer) to advance a 2-inch-diameter by 2-foot-long stainless steel Macrocore® fitted with a dedicated acetate liner to 1 foot bgs. After the Macrocore® is advanced to the specified depth, field personnel will carefully extract the Macrocore® from the borehole to minimize soil loss, remove the acetate liner containing the soil core from the Macrocore®, cut the acetate liner open, and photograph the soil core. Field personnel will record the length of each recovered soil core in a field log book then score the soil core at 6-inch intervals and field screen with a photoionization detector (PID). PID readings will be recorded in a field log book. If other sampling methods are required to collect soil, field personnel will attempt to remove a volume of soil approximately 1 foot long and 3 to 6 inches thick from 0.0 to 1.0 foot bgs and 1.0 to 2.0 feet bgs, while attempting to minimize soil disturbance. Field personnel will process this soil volume in the same manner as a soil core contained in a Macrocore® acetate liner, as described above.

The soil's physical characteristics and other relevant visual observations will be recorded in a field log book. When soil characterization is complete, a composite sample will be collected from the remaining soil in the soil core. At the locations off the landfill (SS-165 through SS-176) soil samples will be collected from the 0.0 to 1.0 foot bgs and 1.0 to 2.0 foot bgs. At the locations on the landfill, soil samples will be collected from the 1-foot interval beneath the landfilled material and the 1-foot interval

above the clay layer that underlies the site. At locations SS-184 through SS-191, soil samples will be collected from the 0.5 to 1.0 foot bgs. The volatile organic compound (VOC) fraction will be collected from the lower 6-inches within each of these intervals at sample locations where VOC analysis will be conducted.

Soil samples will be collected using decontaminated, non-dedicated stainless steel hand-tools (e.g., spoons, scoops or trowels) and bowls. Field personnel will place soil samples in laboratory-supplied containers. Field personnel will document, label, package and ship soil samples in accordance with procedures provided in Worksheet #21 of the QAPP (ARCADIS 2014b). Non-disposable sample equipment (e.g., stainless steel bowls and spoons, Macrocore®, hand-auger, shovel) will be decontaminated between uses at subsequent sampling locations in accordance with the Equipment Decontamination SOP presented in the QAPP (ARCADIS 2014b).

Field personnel will advance the Macrocore® or other hand tools until adequate sample volume is obtained or until it is determined that a soil sample cannot be collected due to lack of soil at a sampling location. Field personnel will advance the Macrocore® or other tools a maximum of four times within 5 to 10 feet of each proposed sampling location in an attempt to obtain adequate sample volume. If adequate sample volume cannot be obtained after four attempts, the sampling area will be widened until adequate sample volume has been obtained.

Some sampling will take place in potential bog turtle habitat. Field personnel conducting sampling activities in potential bog turtle habitat will implement United States Fish and Wildlife Service (USFWS)-recommended conservation measures as described in Section 3.1.1 of the Data Gaps SAP (ARCADIS 2014a).

The horizontal and vertical locations of all soil samples will be surveyed by a New Jersey licensed land surveyor.

2.1.3 Soil Sample Analyses

Soil samples will be analyzed for the COCs outlined in Table 1. The proposed soil samples that are off the boundary of the landfill (perimeter samples) are in native soil (SS-165 through SS-167 and SS-169 through SS-176). The proposed analyses for these perimeter samples include Target Compound List (TCL) semi-volatile organic compounds (SVOCs), SVOCs by selective ion monitoring (SIM), polychlorinated biphenyls (PCBs) (as Aroclors), pesticides, Target Analyte List (TAL) metals, and cyanide. Full TCL/TAL parameters, SVOCs by SIM, PCB congeners, and

dioxins/furans are proposed for SS-168. The proposed soil samples that are within the boundary of the landfill (interior samples) are in landfill material (SS-177 through SS-183). The proposed analyses for these interior samples include full TCL/TAL parameters and SVOCs by SIM. Soil samples SS-184 through SS-191, which are located near MW-10 and MW-3, will be analyzed for only VOCs.

2.2 Sediment Sampling

2.2.1 Sediment Sample Locations

The proposed sediment sampling locations (locations SD-45 through SD-69) are shown on Figures 3a and 3b, and are summarized in Table 1. The order of sampling will be from downstream to upstream locations. The position of sample locations may be adjusted based on accessibility or on other information gathered during field activities. Site conditions may change in response to precipitation or other factors. As a result, samples that are anticipated to be sediment may be dry and considered soil at the time of sampling and will be collected using soil sampling techniques (see Section 2.1). If locations need to be relocated more than 10 feet from the proposed location, the need for a Field Change Request will be discussed with USEPA prior to sampling.

2.2.2 Sediment Sampling Procedures

Sediment samples will be collected in accordance with sampling procedures developed based on USEPA, USEPA ERT, and NJDEP sediment sample collection guidance documents (USEPA 1995, 1994; NJDEP 2005, 1998).

Sediment samples will be collected by advancing a dedicated Lexan® coring device or stainless steel Macrocore® sampler equipped with a dedicated acetate liner to a minimum of 2 feet beneath the surface water/sediment interface. One of these sampling methods will be selected based on site conditions at the time of sample collection. Each sediment core will be field screened with a PID. PID readings, descriptions of the sediment's physical characteristics, and other relevant visual observations will be recorded in a field log book. Sediment samples will be collected from the 0.0 to 1.0 foot bgs and 1.0 to 2.0 foot bgs. At sample locations where VOC analysis will be conducted (i.e., SD-61 and SD-62), a sample for VOC analysis will be collected from the 0.5 to 1.0 and 1.5 to 2.0 foot interval in accordance with NJDEP (1998). The remaining sediment from the 0.0 to 1.0 and 1.0 to 2.0 foot intervals will then be homogenized and transferred directly into laboratory-supplied containers for other analytical parameters. Field personnel will document, label, package and ship



Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill
Superfund Site
Chatham, New Jersey

sediment samples in accordance with procedures provided in Worksheet #21 of the QAPP (ARCADIS 2014b).

The locations of all sediment samples will be surveyed by a New Jersey licenses land surveyor.

2.2.3 Sediment Sample Analysis

Sediment samples will be analyzed for the COCs outlined in Table 1. All of the proposed sediment samples are off the boundary of the landfill in native sediment. The proposed analyses for sediment samples include TCL SVOCs, SVOCs by SIM, PCBs (as Aroclors), pesticides, TAL metals and cyanide. Sediment samples SD-61 and SD-62 (NJDEP samples 16 and 17, respectively) will be analyzed for full TCL/TAL parameters and SVOCs by SIM. VOCs are included in these two samples in order to delineate VOCs detected in soil samples SS-109 and POI-3. The sediment samples collected at location SD-52 and SD-69 will also be analyzed for PCB congeners. The sediment samples collected at locations SD-53, SD-61 and SD-63 will also be analyzed for dioxins/furans. The sediment samples collected at locations SD-57 and SD-62 will be analyzed for both PCB congeners and dioxins/furans. All sediment samples will also be analyzed for pH, total organic carbon, and grain size.

2.3 Analytical Procedures

All analyses will be performed by TestAmerica Laboratories, Inc. (TestAmerica) using current USEPA methods. TestAmerica is a current participant in the Contract Laboratory Program (CLP). The analytical procedures are included in Table 1. Additional information on TestAmerica and the analytical procedures is provided in the QAPP (ARCADIS 2014b).



Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill
Superfund Site
Chatham, New Jersey

3. Schedule

Implementation of the proposed soil and sediment sampling program will begin within 2 weeks after USEPA's approval of this Addendum 1 to the SAP and Addendum 1 of the QAPP. Sample collection will require approximately 4 weeks, and sample analyses will be completed 4 weeks after collection of the last sample. Data validation will require an additional 4 weeks after analysis of the last sample. Therefore, the total time to implement this work after USEPA approval is 12 weeks. If field conditions or other factors require changes to sample locations or methods, and/or if Field Change Requests must be submitted to and approved by USEPA, the schedule will be adjusted accordingly. The schedule for submittal of the final report will depend on the completion of this sampling and other tasks (monitoring well installation and sampling) which are not part of this addendum. The Group will compress this schedule if sampling, laboratory analysis, and/or data validation can be completed in less time than anticipated.



Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill
Superfund Site
Chatham, New Jersey

4. Project Management

4.1 Staffing

Implementation of Data Gap SAP activities will require integration of personnel from various organizations, collectively referred to as the “Project Team.” Responsibilities of each member of the project team are presented in the QAPP (ARCADIS 2014b).

A list of key project management personnel is provided below.

Company/Organization	Title	Name	Phone Number
USEPA	Remedial Project Manager	Betsy Donovan	212-637-4369
USEPA	QA Manager	TBD	TBD
NJDEP	Case Manager	Jill McKenzie	609-292-1993
The Group	Designated Project Coordinator of the Rolling Knolls Landfill Site Settling Parties (Group)	Gary Fisher	908-582-5771
Independent Consultant	Senior Consultant	John Persico, P.G.	609-903-6227
ARCADIS	Project Manager	Suzanne Walls	865-777-3502
ARCADIS	QA Manager	Dennis Capria	315-671-9299

TBD – To be determined

4.2 Coordination

Personnel performing RI/FS Work Plan activities will be directed by representatives of the Project Team. A project organizational chart is provided as Figure 4.



Addendum 1 to the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill
Superfund Site
Chatham, New Jersey

5. References

ARCADIS U.S., Inc. 2014a. Data Gaps Sampling and Analysis Plan. November.

ARCADIS U.S., Inc. 2014b. Quality Assurance Project Plan. December.

New Jersey Department of Environmental Protection. 1998. Guidance for Sediment Quality Evaluations.

New Jersey Department of Environmental Protection. 2005. Field Sampling Procedures Manual.

USEPA. 1995. *Superfund Program Representative Sampling Guidance; Volume 5: Water and Sediment; Part 1 – Surface Water and Sediment*. Office of Emergency and Remedial Response, Office of Solid Waste and Emergency Response.

USEPA. 1994. *Sediment Sampling - SOP #: 2016*. Emergency Response Team.

Table 1
Sample Locations, Depths, and Analyses
 Data Gaps Sampling and Analysis Plan Addendum 1
 Rolling Knolls Landfill Superfund Site
 Chatham, New Jersey

Sample ID	NJDEP Sample ID ¹	Sample Media	Depth Interval (Feet)	Sample Collection Method	Laboratory Analyses ²										Notes	
					VOCs	SVOCs	SVOCs - SIM	Full TCL/TAL	PCBs (as Aroclors)	PCB Congeners	Dioxins/Furans	Pesticides	TAL Metals and Cyanide	pH, TOC, Grain Size		
Soil Samples																
SS-165 ³	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-166 ³	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-167 ³	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-168 ³	NA	Soil	0.0-1.0	Macrocore			X	X		X	X					
			1.0-2.0				X	X		X	X					
SS-169 ⁴	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-170 ⁴	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-171 ⁴	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-172 ⁴	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-173 ⁴	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-174 ⁴	NA	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-175	6	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-176	14	Soil	0.0-1.0	Macrocore		X	X		X			X	X			
			1.0-2.0			X	X		X			X	X			
SS-177	29	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-178	30	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-179	31	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-180	32	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-181	33	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-182	34	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-183	35	Soil	TBD	Macrocore			X	X								
			TBD				X	X								
SS-184	NA	Soil	0.0-1.0	Macrocore	X										Delineation for MW-10	
SS-185	NA	Soil	0.0-1.0	Macrocore	X											
SS-186	NA	Soil	0.0-1.0	Macrocore	X											
SS-187	NA	Soil	0.0-1.0	Macrocore	X											
SS-188	NA	Soil	0.0-1.0	Macrocore	X											Delineation for MW-3
SS-189	NA	Soil	0.0-1.0	Macrocore	X											
SS-190	NA	Soil	0.0-1.0	Macrocore	X											
SS-191	NA	Soil	0.0-1.0	Macrocore	X											
Sediment Samples																
SD-45 ³	NA	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X			X	X	X		
			1.0-2.0			X	X		X			X	X	X		
SD-46 ³	NA	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X			X	X	X		
			1.0-2.0			X	X		X			X	X	X		
SD-47 ³	NA	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X			X	X	X		
			1.0-2.0			X	X		X			X	X	X		
SD-48 ⁴	NA	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X			X	X	X		
			1.0-2.0			X	X		X			X	X	X		
SD-49 ⁴	NA	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X			X	X	X		
			1.0-2.0			X	X		X			X	X	X		
SD-50 ⁴	NA	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X			X	X	X		
			1.0-2.0			X	X		X			X	X	X		

Table 1
Sample Locations, Depths, and Analyses
 Data Gaps Sampling and Analysis Plan Addendum 1
 Rolling Knolls Landfill Superfund Site
 Chatham, New Jersey

Sample ID	NJDEP Sample ID ¹	Sample Media	Depth Interval (Feet)	Sample Collection Method	Laboratory Analyses ²										Notes
					VOCs	SVOCs	SVOCs - SIM	Full TCL/TAL	PCBs (as Aroclors)	PCB Congeners	Dioxins/Furans	Pesticides	TAL Metals and Cyanide	pH, TOC, Grain Size	
Sediment Samples (continued)															
SD-51	2	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-52	3	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X	X		X	X	X		
			1.0-2.0		X	X		X	X		X	X	X		
SD-53	4	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X		X	X	X	X		
			1.0-2.0		X	X		X		X	X	X	X		
SD-54	5	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-55	7	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-56	8	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-57	9	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X	X	X	X	X	X		
			1.0-2.0		X	X		X	X	X	X	X	X		
SD-58	10	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-59	12	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-60	13	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-61	16	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X			X			X	Delineation sample for SS-109	
			1.0-2.0			X	X			X			X		
SD-62	17	Sediment	0.0-1.0	Lexan or Macrocore sampler		X	X		X	X			X	Delineation sample for POI-3	
			1.0-2.0			X	X		X	X			X		
SD-63	18	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-64	19	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-65	22	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-66	23	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-67	25	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-68	27	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X			X	X	X		
			1.0-2.0		X	X		X			X	X	X		
SD-69	28	Sediment	0.0-1.0	Lexan or Macrocore sampler	X	X		X	X		X	X	X		
			1.0-2.0		X	X		X	X		X	X	X		

Abbreviations:

PCBs = polychlorinated biphenyls

TOC = total organic carbon

TAL= target analyte list

TBD = to be determined. Sample depth is contingent on the depth of landfilled material observed in the boring and the depth of the clay layer.

One sample will be collected immediately beneath the landfilled material and one sample will be collected immediately above the clay.

VOC = volatile organic compound

TCL = target compound list

NA = not applicable

SIM = selective ion monitoring

SVOC = semivolatile organic compound

TOC = total organic carbon

¹ - Complete NJDEP sample IDs were provided by NJDEP on July 20, 2015. These sample IDs are referenced in the August 17, 2015 comments from USEPA on Addendum 1 to the SAP and are included here for clarity.

² - Analyses included in the full TCL/TAL parameter list include: VOCs, SVOCs, PCBs (as Aroclors), pesticides, and metals plus cyanide.

Sample analyses will be conducted using the following analytical methods:

Target Compound List organics (VOCs, SVOCs, PCBs and pesticides) via SOM01.2, *Contract Laboratory Program (CLP Statement of Work for Organic Analysis)*.

Target Analyte List metals and cyanide via ISM01.3, *CLP Statement of Work for Inorganic Analyses*.

PCB Congeners via USEPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by HRGC/HRMS*.

Dioxins and furans via USEPA Method 1613, *Dioxins and Furans in Water, Soil, Sediment and Tissue by HRGC/HRMS*.

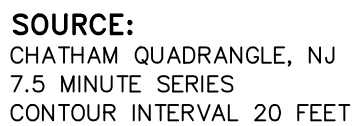
pH via USEPA Method 9045D.

TOC via the Lloyd Kahn method.

Grain size via ASTM D-422.

³ - Sample requested by USEPA

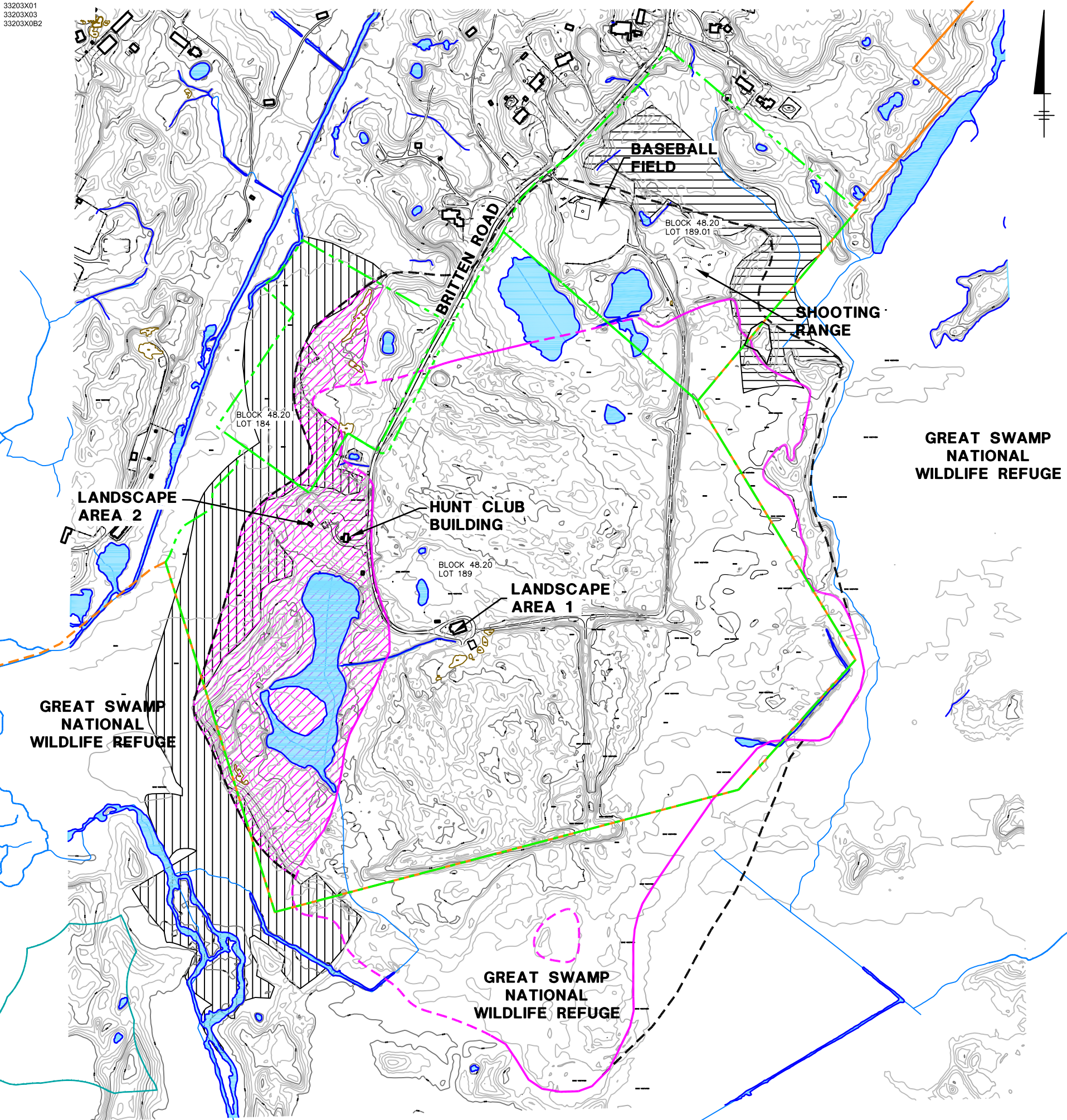
⁴ - Sample requested by the Group.



SITE LOCATION



XREFS: 33203X01
33203X03
33203X0B2
IMAGES: PROJECTNAME: --



LEGEND:

- OPEN WATER
- PRE-REMEDIATION INVESTIGATION PROJECTED EDGE OF LANDFILLED MATERIALS
- EDGE OF LANDFILLED WASTES OBSERVED DURING TEST PIT ACTIVITIES (DASHED WHERE APPROXIMATE)
- GREAT SWAMP NATIONAL WILDLIFE REFUGE PROPERTY BOUNDARY (DASHED WHERE APPROXIMATE)
- TAX PARCELS
- WASTE AND DEBRIS OBSERVED ON GROUND SURFACE BUT NOT OBSERVED OR ANTICIPATED TO BE BELOW GROUND SURFACE
- POTENTIAL BOG TURTLE HABITAT AREA A (35.31 ACRES)
- POTENTIAL BOG TURTLE HABITAT AREA B (10.89 ACRES)

SOURCES:

- BASEMAP FROM JAMES M. STEWART INC., LAND SURVEYORS, PHILADELPHIA, PA., (ELECTRONIC FILE: 292406.DWG DATED: 6/30/06)
- TAX PARCEL DATA FOR CHATHAM TOWNSHIP WAS PROVIDED BY CIVIL SOLUTIONS.



NOTES:

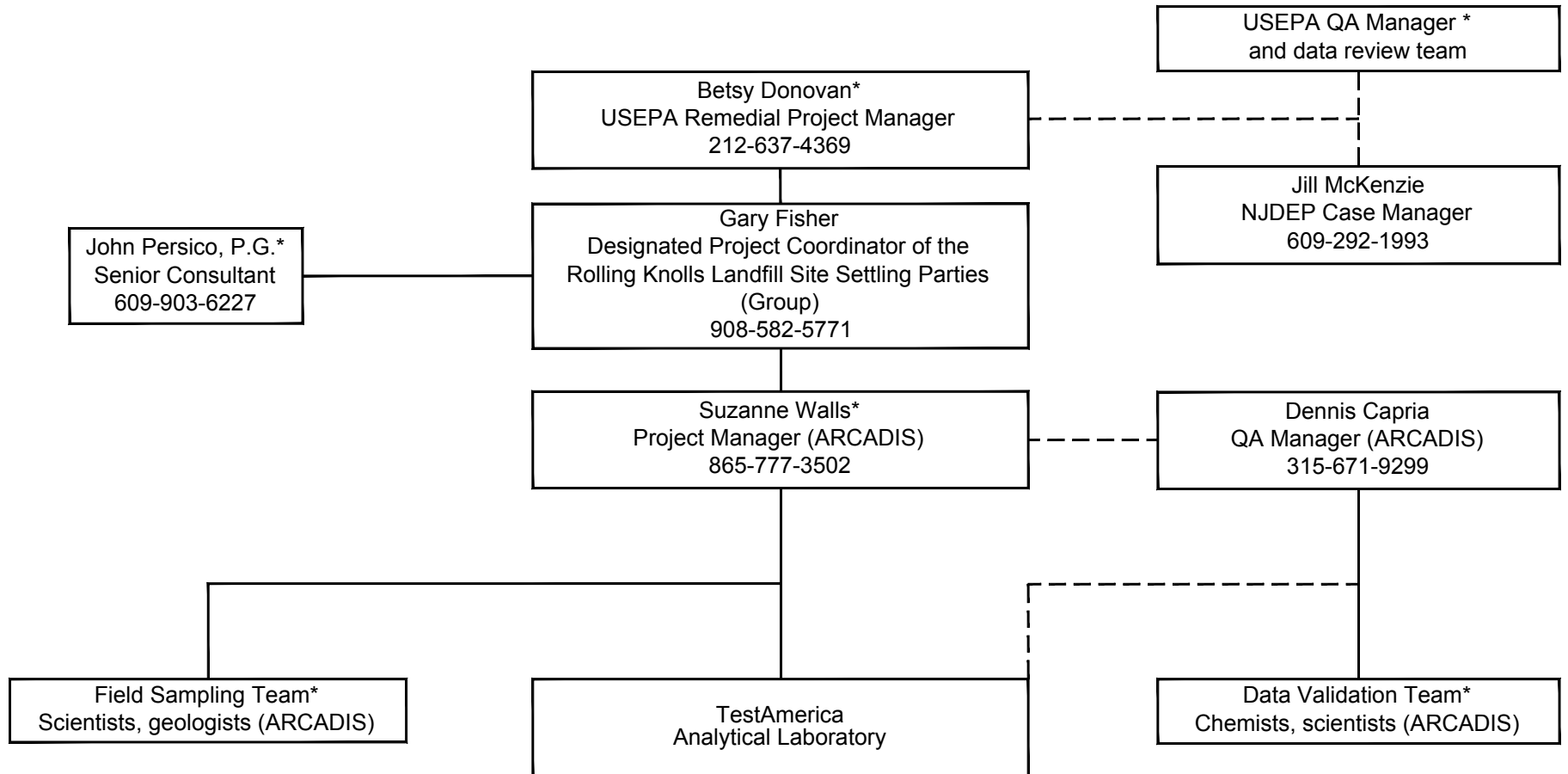
- THE PRE-REMEDIATION INVESTIGATION PROJECTED EDGE OF LANDFILLED MATERIALS ON THIS FIGURE IS APPROXIMATE AS DRAWN AND IS BASED ON VISUAL OBSERVATIONS OF THE GROUND SURFACE MADE DURING SITE VISITS CONDUCTED JUNE 20, 2006 THROUGH JULY 14, 2006.
- THE EDGE OF LANDFILLED WASTES OBSERVED DURING TEST PIT ACTIVITIES IS DRAWN BASED ON OBSERVATIONS OF MATERIALS EXCAVATED DURING TEST PIT ACTIVITIES CONDUCTED FROM JULY 26, 2007 TO SEPTEMBER 6, 2007 AND MARCH 26, 2008.
- THE PORTION OF THE GREAT SWAMP NATIONAL WILDLIFE REFUGE (GSNWR) PROPERTY BOUNDARY ON THIS FIGURE WITHIN CHATHAM TOWNSHIP, NJ WAS OBTAINED FROM CHATHAM TOWNSHIP TAX PARCEL DATA PROVIDED BY CIVIL SOLUTIONS. THE PORTION OF THE GSNWR PROPERTY BOUNDARY ON THIS FIGURE OUTSIDE OF CHATHAM TOWNSHIP IS APPROXIMATE AND WAS OBTAINED FROM THE UNITED STATES FISH AND WILDLIFE SERVICE (GEOGRAPHIC INFORMATION SYSTEMS AND SPATIAL DATA).
- BLOCK 48.20, LOTS 184 AND 189 ARE OWNED BY ROBERT J. MIELE AS TRUSTEE FOR THE TRUST CREATED BY THE LAST WILL AND TESTAMENT OF ANGELO J. MIELE. BLOCK 48.20, LOT 189.01 IS OWNED BY THE GREEN VILLAGE FIRE DEPARTMENT.

ROLLING KNOLLS LANDFILL SUPERFUND SITE
CHATHAM, NEW JERSEY
**DATA GAPS SAMPLING AND ANALYSIS PLAN
ADDENDUM 1**

SITE PLAN



XREFS: IMAGES: PROJECTNAME: ----



ROLLING KNOLLS LANDFILL SUPERFUND SITE
CHATHAM, NEW JERSEY
**DATA GAPS SAMPLING AND ANALYSIS PLAN
ADDENDUM 1**

PROJECT ORGANIZATIONAL CHART



FIGURE

4